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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/018,116	04/19/2002	Lutz Fabian	EF377397961US	1556
21003	7590	02/03/2006	EXAMINER	
BAKER & BOTTS 30 ROCKEFELLER PLAZA NEW YORK, NY 10112			DUONG, THANH P	
			ART UNIT	PAPER NUMBER
			1764	

DATE MAILED: 02/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/018,116	Applicant(s) FABIAN ET AL.	
	Examiner Tom P. Duong	Art Unit 1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 20-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 20-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 9, 2006 has been entered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 20-31 and 36-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barton '877 in view of Carr et al. (5,011, 520). Regarding claims 20-21, Barton discloses a waste gas cleaning system for removing harmful and/or toxic gases from a gas stream (Fig. 1), comprising: a reaction chamber (14) having an inlet (60) for receiving a gas stream to be treated and an outlet (90); a plasma source (12) coupled to said reaction chamber (14) for providing excitation energy (Col. 3 lines 20-26) to said chamber and form a plasma therein; and a liquid jet (94) arranged at said reaction chamber outlet and generating negative pressure (Col. 6, lines 31-37) in said reaction chamber (14). With respect to the liquid jet pump, Barton discloses the spray nozzles (94) containing spray ring 16, which is connected to the reaction vessel outlet, connected to reservoir 98 of high pressure quench water (Col. 5, lines 15-45). The

spray nozzles appear to constitute a liquid jet pump of the claimed invention being the fact that the liquid jet pump (94) is arranged to draw treated gases out of said reaction chamber via variable pumps (104, 112), which pushes the mixed liquid and treated gas out of the reaction chamber or created a negative pressure in the reaction chamber (Col. 5, lines 15-60). Alternatively, Carr makes it clear that negative pressure suction stage (20) contains the spray nozzle opening, which is directed downwardly to form a spray field 88 inside the structure 84 (Fig. 5). The inside surface 90 of the structure 84 converges to form a venturi. Carr further discloses the spray action, together with low constriction 90, is adjusted to create suction sufficient to draw the gaseous effluent into the main scrubbing chamber 22 and simultaneously intimately to mix the effluent with the scrubbing liquid (Col. 8, lines 35-43). Such configuration constitutes a liquid jet pump of the claimed invention. Thus, it would have been obvious in view of Carr to one having ordinary skill in the art to modify the apparatus of Barton with a liquid jet pump as taught by Carr in order to promote intermixing between the gas and scrubbing liquid and maintain a negative pressure in the scrubber system. Regarding claim 22, the above-applied references fail to disclose the specific negative pressure range of the claimed invention, however, it would have been *prima facie* obviousness to optimize the scrubbing system to obtain such negative pressure thru routine experimentation. See *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Regarding claim 23, Barton discloses the liquid jet pump is provided with a sorption medium (110). Regarding claims 24-26 and 37, Barton fails to disclose a recirculation system including said liquid jet for said sorption medium. Carr teaches a recirculation tank 218 with coolant coils (Col. 13, lines 35-38) and control panel 224 to control the recirculation flow rate (Col.

13, lines 45-52) and a reservoir having neutralized agent (Col. 13, lines 52-54) to prevent build up in the system and further facilitating self-cleaning of the gas in the scrubber (Col. 4, lines 34-41). Thus, it would have been obvious in view of Carr to one having ordinary skill in the art to modify the scrubbing system of Barton with a recirculation system as taught by Carr in order to control the build up in the system and facilitating self-cleaning of the gas scrubber. Regarding claim 27, it is conventional to provide a circulation pump with a compressed air-driven diaphragm pump in the scrubbing system and it would have been obvious to do so here due to its low maintenance and reliability. Regarding claim 28, Barton discloses a secondary air inlet (via line 44), which appears to contribute to the negative pressure in the reaction chamber. Regarding claim 29, Barton discloses an additional gas (via line 70) to the reaction burner 12 to facilitate the combustion process. Regarding claims 30-31, it is conventional to provide additional gas such as hydrogen, oxygen, and water vapor the reaction chamber and it would have been obvious to do so here to facilitate the oxidation and/or decomposition process. Regarding claim 36, Barton discloses the output of the pump 112 is control by a pH sensor and control is connected to the metering pump to provide alkaline material to the quench water (Col. 5, lines 46-63). Regarding claim 38, Barton discloses the suction line includes at least one aerosol filter (24).

2. Claims 32-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applied references (Barton '877 in view of Carr et al. '520) and further in view of Wofford et al. (5,750,823). The applied references disclose the plasma source but is

silent with respect to a non-thermal plasma source with excitation energy in the microwave range of the claimed invention. Wofford teaches the waste gas is exposed in a non-thermal plasma (Abstract) with microwave energy (Col. 3, lines 5-10) having the microwave range (Col. 5, lines 1-10) of the claimed invention and the use of a non-thermal plasma provide the advantages of reduced energy consumption and more easily removed by-products (Col. 1, lines 4-67 and Col. 2 lines 1-15). Thus, it would have been obvious in view of Wofford to one having ordinary skill in the art to modify the apparatus of the applied references with a non-thermal plasma source as taught by Wofford in order to gain the above advantages.

Response to Arguments

Applicant's arguments filed January 9, 2006 have been fully considered but they are not persuasive. The Barton rejection is withdrawn and the argument with respect to Barton's rejection, alone, is moot.

The argument with respect to the Barton and Carr rejection has been carefully considered but are not persuasive. (1) Applicants argued "*Barton does not teach or suggest employing liquid jet pumps to draw gases through a plasma processing reaction chamber.*" Examiner respectfully disagrees. As described above, it is submitted that the spray nozzles appear to constitute a liquid jet pump of the claimed invention being the fact that the liquid jet pump (94) is arranged to draw treated gases out of said reaction chamber via variable pumps (104, 112), which pushes the mixed liquid and treated gas out of the reaction chamber or created a negative pressure in the reaction chamber (Col. 5, lines 15-60). (2) Applicants argued "*Carr does not show,*

teach or suggest any mechanism for pumping or drawing gas through a plasma reaction chamber.” Examiner respectfully disagrees. As described above, Carr makes it clear that negative pressure suction stage (20) contains the spray nozzle opening, which is directed downwardly to form a spray field 88 inside the structure 84 (Fig. 5). The inside surface 90 of the structure 84 converges to form a venturi. Carr further discloses the spray action, together with low constriction 90, is adjusted to create suction sufficient to draw the gaseous effluent into the main scrubbing chamber 22 and simultaneously intimately to mix the effluent with the scrubbing liquid (Col. 8, lines 35-43). Such configuration constitutes a liquid jet pump of the claimed invention. Thus, it would have been obvious in view of Carr to one having ordinary skill in the art to modify the apparatus of Barton with a liquid jet pump as taught by Carr in order to promote intermixing between the gas and scrubbing liquid and maintain a negative pressure in the scrubber system. (3) Applicants also argued that “*Carr’s negative pressure providing stage, which is located at the inlet or upstream of the main chamber 22, creates only limited negative pressure to push premixed gaseous effluent into the main chamber 22 and not across or through the main chamber 22.*” Examiner respectfully disagrees. It is submitted that the main chamber 22 in Carr’s reference is a main scrubbing chamber not a reaction chamber (12) as claimed. (4) With respect to the argument of Wofford’s reference, the applied references essentially disclose the claimed invention but fail to disclose the plasma source of a “non-thermal plasma”. Wofford is cited to show the benefit of using a non-thermal plasma for reducing energy consumption and more easily removed by-products (Col. 1, lines 4-67 and Col. 2 lines 1-15). Thus, it would have been obvious in view of Wofford to one having ordinary skill

in the art to modify the apparatus of the applied references with a non-thermal plasma source as taught by Wofford in order to gain the above benefits.

Conclusion

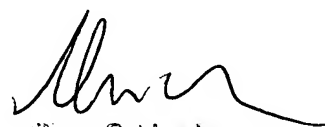
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tom P. Duong whose telephone number is (571) 272-2794. The examiner can normally be reached on 8:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tom Duong
January 30, 2006




Glenn Caldarola
Supervisory Patent Examiner
Technology Center 1700